Thunder Tiger

SPARROWHAWK XXT XXB

1/10 BRUSHLESS POWERED 4WD OFF-ROAD BUGGY/TRUGGY
1:10 無刷動力四驅越野車/卡車

⚠ This radio control model car is not a toy! Before beginning operation, please read this manual thoroughly.
本產品為高性能模型非一般玩具，操作前請詳閱本產品說明書。

The contents are subject to change without prior notice due to product improvements and specification changes.
本套件所附之零件可能跟圖示有所差異。因產品後續之設計研發或功能不斷改善之原因，我們將保留產品規格變更權力，不再另行通知使用者。

Instruction Manual
操作說明書

WARRANTY 品質保證事項

Thunder Tiger Corporation guarantees this model kit to be free from defects in both material and workmanship. The total monetary value under warranty will in no case exceed the cost of the original kit purchased. This warranty does not cover any components damaged by use or modification. Part or parts missing from this kit must be reported within 60 days of purchase. No part or parts will be sent under warranty without proof of purchase. To receive part or parts under warranty, the service center must receive a proof of purchase and/or the defective part or parts. Should you find a defective or missing part, contact the authorized Thunder Tiger Service/Distributor nearest you. Under no circumstances can a dealer or distributor accept return of a kit if assembly has started.

本公司對於製造過程中產生之瑕疵，負完全品質保證責任。
保證事項僅限於產品本身與隨產品所附之零配件。
品質保證不包含下列事項
因使用、組裝或調整本產品所發生之損壞。
其他所有非產品本身品質所造成之損壞。

INTRODUCTION 前言

Thank you for your purchase of this Thunder Tiger product. You should enjoy many hours of fun and excitement from this advanced R/C model. Thunder Tiger strives to bring you the highest level of quality and service we can provide. We race and test our cars around the world to bring you state-of-the-art products.
We offer on-line help on our www.thundertiger.com forum and our product specialists are ready to take your call if you have any technical questions. Please read all instructions and familiarize yourself with the systems and controls of this model before running. Have fun and enjoy the exciting world of R/C!

感謝您購買雷虎科技產品。雷虎科技以提供最高品質的產品及服務作為持續努力的目標。並藉由參與競賽及重覆測試產品，不斷累積經驗，進而提昇設計及製造品質，期望能呈現給您最頂級之工藝產品。本使用說明書包含了操作本產品前所需注意的重要事項，建議您在開始準備及操作本產品之前，能詳閱此說明書，並熟悉本產品之操控系統。若是您在產品的操作及使用上有任何的疑問，歡迎多加利用我們所提供的24小時諮詢留言版或洽詢雷虎科技授權經銷商。雷虎科技的全球英文網址為www.thundertiger.com，我們將竭誠為您服務！

CAUTION 注意事項

Thanks you for purchasing a Thunder Tiger product. **Please read all instructions thoroughly before operation.**

1. This product is not a toy. It is a high performance model product. It is important to familiarize yourself with the model, its manual, and its construction before assembly or operation. Children's operating under the supervision of an adult is necessary.
2. Always keep this instruction manual ready at hand for your assembling and operating reference, even after completing the assembly.
3. Do not operate model products in rain, on public roads, near crowds, near airport, or near areas with restricted radio operation.
4. This product, its parts, and its construction tools can be harmful to your health. Always exercise extreme caution when assembling and/or operating this product. Do not touch any part of model that rotates.
5. Check your radio frequency with the proper operating frequency of the area or country. Always check if there are any modelers operating on the same frequency as you are. Also, check your radio for proper operation before operating a model.
6. Use an adequate charger for the batteries and follow the instruction correctly.
7. Right after use, do not touch equipment on the model because they may generate high temperatures!
8. Do not stall the motor. The ESC may fail if power is applied to the motor when car cannot move freely.
9. By the act of assembling or operating this product, the user accepts all resulting liability. If the buyer is not prepared to accept this liability, then he/she should return this product in new, unassembled, and unused condition to the place of purchase.

WARNING: To avoid a possible fire hazard, ALWAYS unplug the battery after use. Do NOT leave your vehicle unattended with the battery plugged in.

感謝您購買雷虎科技產品，在您開始操作本產品前，請詳閱本產品說明書。

1. 本產品為高性能模型產品非一般玩具，組裝與操作過程皆須由成人陪同。請詳讀此本使用說明書，避免因組裝錯誤與操作不當造成損壞。
2. 請妥善保管此說明書，對於後續維修、操控說明將可提供您協助。
3. 請勿於雨天、公衆空間、道路、機場附近與其他限制遙控模型活動區域，操控本項產品。
4. 此項產品具有相當之危險性，於組裝、調整、操控上的不熟悉都可能造成自身或他人的傷害，當發生這些傷害事件時，製造商是可以免除責任的，建議您於初次使用本產品前，先行請教具有相當程度經驗同好或是專業雷虎經銷商與模型專賣店。
5. 請您確認您所在地區對於頻率規定之相關法規，來選用適當的頻率，避免與其他同好使用相同頻率造成失控事件。
6. 請使用合格之電池充電器並遵循說明書之使用規範，以免發生危險。
7. 車輛操作後，請小心誤觸碰到會產生高溫之零件部分，以避免燙傷。
8. 車輛作動時，請勿以異物強制停止馬達(輪胎)以避免電子速控器超出承載負荷而失效。
9. 如使用者對於產品品質或操作組裝上所須負擔之風險有任何疑慮，請勿開封組裝或進行操作本產品，並將產品退回原購買地點。

警告！為避免因電線短路等因素而引起之可能災害，請務必於操作本產品後，將電池接頭拔除以避免可能發生之危險！請勿在電池接頭未經拔除前，就將產品儲藏於無法留意之處。

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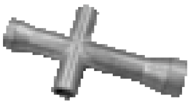
ITEMS REQUIRED FOR OPERATION 周邊配件

RTR CONTENTS 完成車輛配備

ACE RC Cougar PS3i
3-Channel digital 2.4G pistol radio system with Standard Servo.
3動作發射機、接收機及伺服機

Hex Wrench Set, 1.5mm / 2.0mm / 2.5mm / 3.0mm
六角扳手, 1.5mm / 2.0mm / 2.5mm / 3.0mm



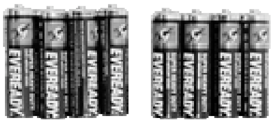
4-Way Wrench
4向六角螺帽套筒板手

ACE R/C BLC-40C speed control
車用無刷馬達速控器40A

RIPPER IBL36/33-540C (SPARROWHAWK XXT)
RIPPER IBL36/39-540C (SPARROWHAWK XXB)
車用無刷馬達

EQUIPMENT NEEDED 需求配件

（Not included in the kit 不包含在此套件内）



AA Alkaline dry batteries
8 pieces for transmitter
發射機用電池

BLC ESC Setting Card
速控器設定版

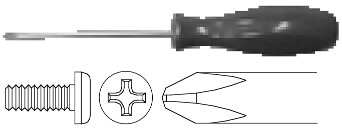
7.2V Compatible Power Charger
(AC/DC Charger)
7.2V充電器

AT6116 US PLUG
AT6117 EU PLUG
AT6118 UK PLUG

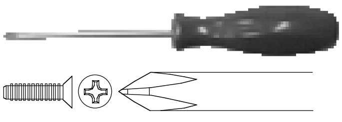
7.2V Battery Pack
7.2V 充電電池條

2937 IB Ni-MH Batter Pack, 7.2V/IB2400
2941 IB Ni-MH Batter Pack, 7.2V/IB3600

TOOLS NEEDED 需求工具



M3



M2

Philips Screwdriver
十字起子

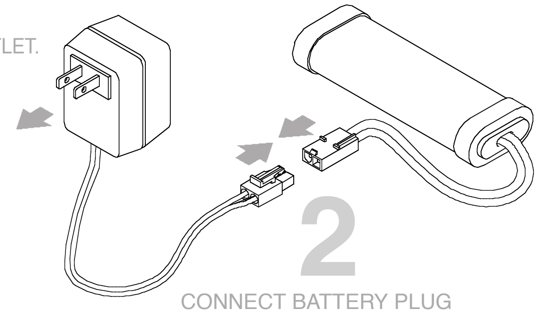
1

1.1 CHARGING THE BATTERY PACK 電池包充電

(Battery and Charger are not included in the kit. **本產品不含電池及充電器**)

a. Once the battery ready to be charged, first plug the AC quick charger into the outlet of AC power source, and then connect the battery input/output harness to the charger.
b. Continued to monitor the battery as it is being charged. As soon as the battery is fully charged, disconnect the battery. from the charger plug (Over-charging or charging incorrectly using inadequate chargers may cause the battery pack to become dangerously hot).
c. Make sure that the battery pack is completely discharged prior to charging. Discharging the battery pack by running the electric motor until it slows down or using a discharger (Not included).
d. For best results, let the battery pack cool before charging. Heat may prevent the battery pack from charging to full capacity and also decreases the performance of the battery.

a. 準備充電時，首先將充電器之插頭插入電源插座，再連接電池之充/放電接頭。
b. 充電過程中請注意電池之充電情況。電池充電完成將電池與充電器接頭分開。(電池過充或是不適當之充電，將可能導致電池產生危險之過熱情況，如電池溫度超過攝氏45度，需立即停止充電。)
c. 電池充電前，最好先確認電池是否已經完全放電。倘若尚未放電完全，可將車子加速直到馬達轉速變慢或使用專業放電器放電(另購)。
d. 為得到最佳之充電效果，電池使用完畢請勿馬上進行充電，充電前請先確認電池溫度已下降再行充電，以延長電池壽命及電池性能。



1.2 LiPo BATTERIES 鋰電池充電注意事項

Lithium Polymer (LiPo) batteries are becoming popular for use in R/C models due to their compact size, high energy density, and high-current output. However, these types of batteries require special care and handling procedures for long life and safe operation.

鋰電池（鋰聚合）因為其形狀的多變性，高電容量及高放電的特性，所以現今已是非常受歡迎的一種遙控模型電池種類。然而由於此種電池具有相當程度的使用風險性，故在使用時「正確的使用」以延長持電池壽命與嚴守「操作安全」這兩點是需特別注意的。

Warning: Lithium Polymer (LiPo) batteries are intended only for advanced users that are educated on the risks associated with LiPo battery use. THUNDER TIGER/ACE RC does not recommend that anyone under the age of 16 use or handle LiPo battery packs without the supervision of a knowledgeable and responsible adult.

Important: Do not use NiCd/NiMH battery chargers for LiPO batteries. If you do not use a special charger for LiPO batteries, they will be damaged.

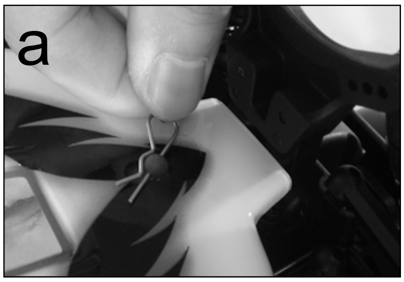
警告：鋰電池（鋰聚合）的使用者需具備進階鋰電池使用知識並瞭解其中可能因未使用錯誤所引發的潛在危險。THUNDER TIGER/ACE RC強烈建議使用者需年滿16歲或是經由具有鋰電池進階使用之是的成人陪同操作。

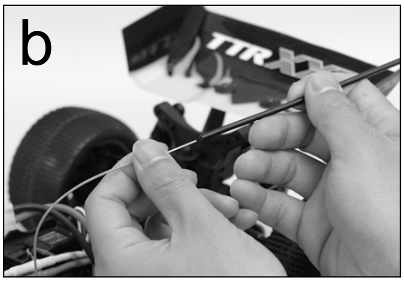
注意：請勿使用鎳氫/鎳鎘充電器對鋰電池進行充電！此舉很可能引起電池的損壞。請使用專業之鋰電池充電器進行鋰電池之充放電。

The ACE RC BLC electronic speed control is able to use LiPo batteries with nominal voltage not to exceed11.1 volts (3S packs). Exceeding these voltages may result in damage to your brushless system. LiPo batteries have a minimum safe discharge voltage threshold that should either not be exceeded. The ACE RC BLC electronic speed control is equipped with built-in Low-voltage detection that cuts the power automatically when batteries have reached their minimum voltage (discharge) threshold. Refer to the low power auto-cut table in the ESC instruction manual. It is the driver's responsibility to stop immediately to prevent the battery pack from being discharged below its safe minimum threshold. It is critical for you, the user, to follow all other instructions supplied by the battery manufacturer and the charger manufacturer for proper charging, use, and storage of LiPo batteries. Make sure you understand how to use your LiPo batteries. Be aware that THUNDER TIGER/ACE RC shall not be liable for any special, indirect, incidental, or consequential damages arising out of the installation and/or use of LiPo batteries in THUNDER TIGER models.

ACE RC BLC系列之無刷馬達速控器在設計上是可以允許使用鋰電池，但須注意請勿使用超過11.1 volts (3S packs)的鋰電池，否則你的無刷馬達速控器及無刷馬達很可能因過高的電壓而燒毀。使用鋰電本身應該也需具有過度放電之保護，以避免電電池本身的壽命及效能產生不可回復性的傷害。ACE RC BLC系列之無刷馬達速控器本身內建有低電壓偵測裝置，當電池電壓低於一定電壓時速控器會進行自動斷電程序以保護電池之壽命。請參考速控器說明書上低電壓斷電表。發生上述斷電情況請操作者即刻暫停操作以防止電池之損壞。操控者在使用鋰電池時應先詳讀電池及充電器廠商所提供之使用操作說明書以瞭解正確的鋰電池充放電方法，儲存及使用方式。請注意！THUNDER TIGER/ACE RC對於消費者因為使用或安裝鋰電池於所屬之遙控模型上而造成任何的直接或間接的損害，無須擔負任何法律責任。

2 PREPARING THE CHASSIS 操作前，車體準備



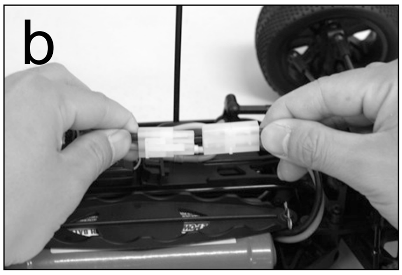


a. Remove the body pins (2 pcs.) and detach the body.
b. Straighten antenna and insert into antenna tube.
c. Put the antenna wire through the antenna pipe. (Do not cut or shorten antenna wire.!) Push the antenna pipe into the chassis mount hole.

a. 將車殼固定車銷(共2個)拆除以取下車殼。
b. 將天線穿套進天線管內。
c. 將天線套管安裝於底板固定孔上(請勿裁短天線以免影響接收距離)。

3 INSTALLING RADIO & POWER SYSTEM BATTERIES 遙控器電池安裝

(Battery shown is not included in the kit 本產品不含充電電池)



a. Install 8pcs alkaline or rechargeable AA-size batteries (Not Included) into transmitter.
b. Install the power pack and connect to the ESC.

Caution: Confirm wiring and connections before connecting thespeed control to the battery. Incorrect polarity will damage your speed control.

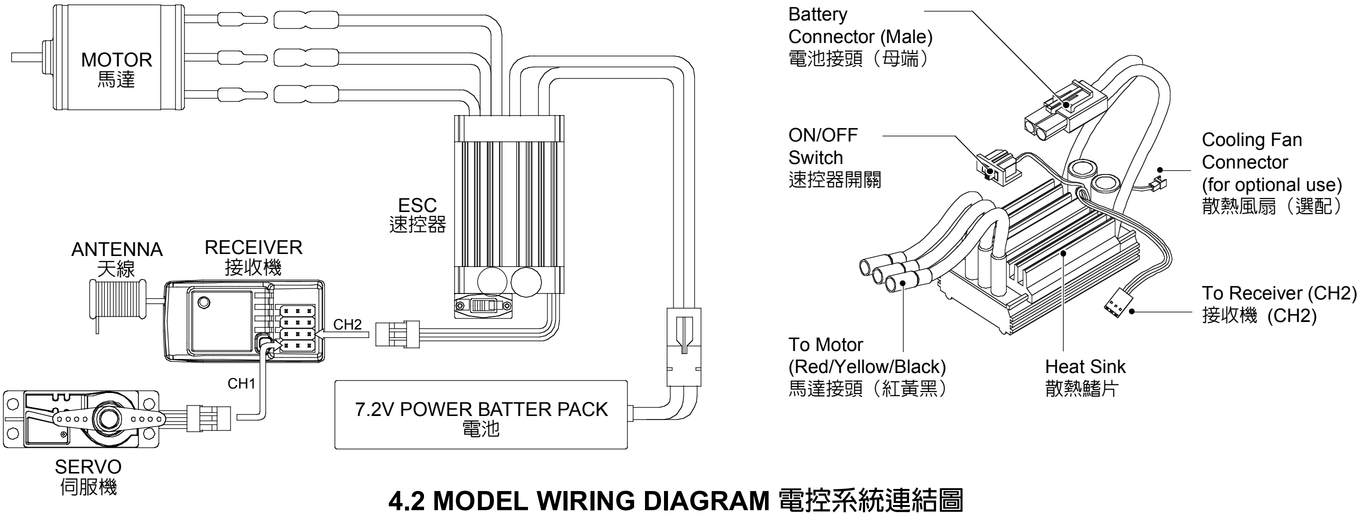
a. 安裝八顆三號鹼性電池或充電電池於發射機內。
b. 將開關座固定於接收機旁(如圖示)。將模型專用7.2V條狀充電電池裝入底板上並以R型固定插銷固定電池上蓋，連接電池條開關與速控器。

注意！如使用自行焊接之充電電池請注意電池與速控器接線之正負極位置（反裝電極將造成電池短路或速控器之損壞）。

4 The ACE RC Cougar PS3i Radio and BLC-40C Brushless Power System 熟悉2.4GHz電控系統及無刷馬達速控器及馬達安裝

1. Transmitter Antenna 天線
2. Power Indicator 電源指示燈
3. Edit Buttons 選單按鈕
4. LCD Display 選單屏幕
5. Digital Steering Trim lever 轉向微調撥桿
6. Digital Throttle Trim lever 油門微調撥桿
7. Digital Steering D/R(Dual Rate) lever 轉向角度大小調整鈕
8. AUX Ch Button 預備頻道切換鈕
9. External Charging Jack 充電器接座
10. 2.4GHz TX RF Module and binding SW 發射模組及校頻配對設定鈕
11. Steering Wheel 轉向舵輪
12. Power Switch 電源開關
13. Throttle Trigger 油門扳機
14. Steering Tension Adjustment 轉向舵輪調整螺絲
15. Battery Cover 電池護蓋

4.1 ACE RC Cougar PS3i 2.4GHz 發射機



4.2 MODEL WIRING DIAGRAM 電控系統連結圖

1. **Transmitter Antenna:** Straighten up the antenna before operating the model.
2. **Power Indicator:** The LED light indicates power is "on" or "off".
3. **Edit Buttons:** The Left and Right buttons are the "functions" selecting keys. The up (+) and down (-) buttons are the keys for adjusting values . Toggle between functions by pressing the "Edit Buttons" (left and right keys) and adjust settings with the up and down keys.
4. **LCD Display:** The Cougar transmitter features an "Easy-to-Read" LCD Display. Battery status, functions and settings are all clearly displayed on the screen.
5. **Digital Steering Trim lever:** Push this lever left or right to adjust the center point on the steering servo. A cursor on the LCD screen's top ruler indicates current Steering Trim adjustments. Steering Trim adjustments ensure the model runs straight.
6. **Digital Throttle Trim lever:** Push this lever up or down to adjust the center point on the throttle/brake servo. A cursor on the LCD screen's left ruler indicates current Throttle Trim adjustments. Throttle Trim adjustments set the braking amount for "Drag Brake" and "Coast Brake".

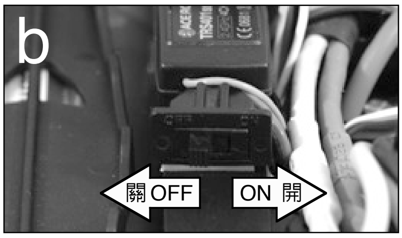
   NOTE: The Digital Throttle Trim function adjusts neutral point without affecting maximum throttle servo travel and full-throttle position.

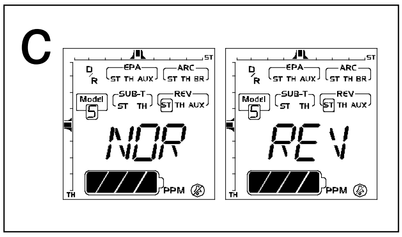
   The Digital Steering Trim function adjusts maximum steering servo travel for both left and right steering. If adjustments are incorrect, steering linkage binding or damages to the steering servo may occur.
7. **Digital Steering D/R(Dual Rate) lever:** Push this lever left or right to adjust the amount of steering dual rate. Right to increase dual rate, left to decrease dual rate.
8. **AUX Ch Button:** Additional control function for the model.
9. **External Charging Jack:** For recharging the transmitter battery (only use a rechargeable NiCd/NiMH battery pack.)
10. **2.4GHz TX RF Module and binding SW:** The Binding SW button is located on the 2.4GHz TX RF module unit.
11. **Steering Wheel:** Controls steering of the model.
12. **Power Switch:** Slide the switch to turn the transmitter on or off. The "DISPLAY" position provides direct access to the transmitter's edit buttons and trim levers without causing frequency interferences to other transmitters. Do not attempt to drive the model under the "DISPLAY" mode.
13. **Throttle Trigger:** Pull or push to control speed and forward / backward motion.
14. **Steering Tension Adjustment:** Use a Phillip type screwdriver to tighten or loosen the tension of the steering wheel.
15. **Battery Cover:** Slide cover to install or remove batteries.

1. **天線**：操作發射機時請將發射機天線扳直。
2. **電源指示燈**：LED顯示燈號顯示開關機狀態，紅色燈號為開機，關機或展示狀態則無燈號。
3. **選單按鈕**：選單左（<）右鈕（>）可移動功能選項，上，選單上(+)下(−)鈕可調整功能選項之設定值。
4. **選單屏幕**：功能選項為方便閱讀及操作，採直接印刷於LCD顯示屏幕上，無須按鈕進入即可一目了然。
5. **轉向微調撥桿**：左右撥動轉向微調撥桿可調整轉向伺服機中立點。調整時LCD顯示屏幕上之ST游標卡尺會隨著調整量大小移動游標標示點位置，基本上此調整撥桿為保持遙控模型之直線性。
6. **油門微調撥桿**：左右撥動油門微調撥桿可調整轉向油門伺服機中立點。調整時LCD顯示屏幕上之TH游標卡尺會隨著調整量大小移動游標標示點位置，基本上此調整撥桿為設定遙控模型之"中立點煞車"及"行進煞車"之行程量。

   調整油門微調撥桿時，油門伺服機之全行程兩端定位點將不會因為中立點位置改變因此而移動位置，此調整將僅進行油門中立點之調整。調整轉向微調撥桿時，轉向伺服機之全行程兩端定位點將因為中立點的改變而做相對位置移動。因此在調整轉向微調撥桿時需注意行程動作是否因為機械結構之限制而造成可能之轉向控制系統發生干涉情形甚至損害伺服機本身。
7. **轉向角度大小調整鈕**：調整此按鈕可調整轉向角度大小。向右按壓此鈕可增加轉向大小行程量，向左則為減少。
8. **預備頻道切換鈕**：本遙控系統提供額外擴充之伺服機之控制頻道。按壓此控制鈕可控制此動作之開啓與關閉。
9. **充電器接座**：請使用鎳氫或鎳鎘專用充電電池及充電器。
10. **2.4GHz發射模組及校頻配對設定鈕**：發射機採用固定式2.4GHz發射模組，模組上之BINDING SW校頻配對設定鈕為配對發射/接收頻率之用。
11. **轉向舵輪**：控制遙控模型之左右轉向。
12. **電源開關**：介於發射機電源"開啓"與"關閉"模式間，可以選擇"調整顯示"模式，選擇此模式發射機將不會傳送操控訊號以方便選手在賽場上的調整以預防可能之頻率干擾。此模式發射機將無法操控遙控模型。
13. **油門扳機**：推拉油門扳機控制遙控模型的前後及煞車動作
14. **轉向舵輪調整螺絲**：使用小型十字起子調整此調整螺絲來改變轉向舵輪旋轉鬆緊度。
15. **電池護蓋**：推移電池護蓋即可取出電池進行更換。

5 RADIO OPERATION 遙控器操作





a. When turning radio system on. Turn the transmitter on first, then turn on the ESC.
b. When turning the radio system off. Turn the ESC off first, then turn off the transmitter.
c. Reversing servos. Enter the NORM and REV mode by pressing the "up" and "down" keys.

Caution: Do not run the transmitter's battery flat or you will lose control of the car. For additional details, please refer to the transmitter instruction manual.

a. 為避免車子失控暴衝，先開啓發射機電源。
b. 接著開啓速控器電源。電源的關閉則是相反的順序，先關速控器電源，再關發射機電源。
c. 伺服機的正逆轉調整功能是用來控制伺服機與發射機控制是否一致？進入圖中之顯示之發射機LCD顯示屏幕上之調整模式，按壓“up”(+)或 “down”(-)按鈕可變換伺服及轉動方向為 “NOR”(正常) 或 “REV”(反轉)。此調整功能可針對不同之伺服機進行調整(方向、油門或預備頻道)。其他注意事項請參考發射機說明書。

6 BINDING PROCESS 安全校頻配對

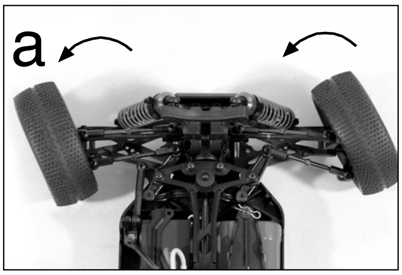
A binding feature is included in the ACE RC Cougar 2.4GHz spread spectrum system to ensure the transmitter and receiver bind properly and prevent interference from other controllers. With the Ready-To-Run package, full binding procedure has been completed at the factory prior to shipping. To manually bind Tx/Rx, please proceed as per the following steps:
a. Press and hold the “Binding SW button on the back side of the transmitter while turning on the transmitter.
b. Release the “Binding SW* button after the green LED flashes indicating the transmitter is binding.
c. Press and hold the bind button on the receiver while turning on the receiver. Binding process will then start automatically.
d. Successful binding is confirmed by the blinking LED turning to constant on the transmitter. The LED on the receiver turns greens. Once binding is complete, the system automatically connects.

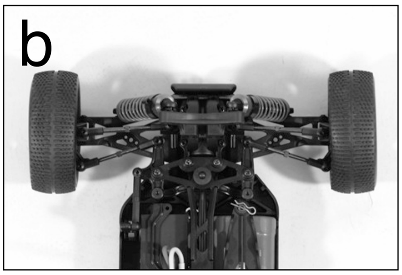
Note: Binding prrocess may take 3~10 seconds to execute. If binding fails, the LED on the receiver will turn red. Please turn off the power and repeat steps a~d.

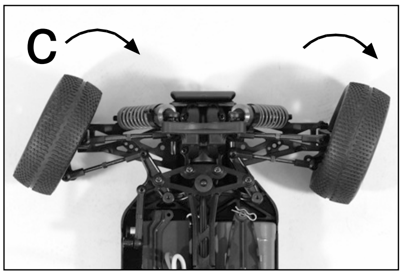
ACE RC Cougar PS3i 採用最先進的專用3動2.4GHz無限展頻遙控系統。這個系統結合發射與接收可以互動溝通模式，跳動式頻道搜尋，使得整體無線遙控系統的傳輸展現精準穩定的特性同時也無須擔心頻率干擾的問題。本完成車搭配預先校頻配對好之遙控系統，無須再調整即可進行操作。如發現無法操控情形發生，需要重新校頻配對，請依照下列步驟重新進行校頻配對程序：
a. 打開發射機電源時，同時持續按壓發射機背面之 "Binding SW" 按鈕。
b. 直到按鈕旁之LED綠燈快速閃爍，再放開 "Binding SW" 按鈕，表示發射機正在進行自動搜尋校頻，此時請不要關閉發射機電源。
c. 然後按壓接收機上之 "Binding SW" 按鈕並同時開啓接收機電源，此時接收機將自動進行校頻配對程序。
d. 一旦完成配對程序，發射機LED燈號會從綠色快速閃爍轉換成持續綠色燈號，接收機LED燈號將從紅色轉換為綠色並持續慢速閃爍。此時表示接收積與發射機以完成配對溝通，可以進行操控。

注意：遙控系統校頻配對可能需要3~10秒執行程序。如果程序執行錯誤，發射及接收模組的LED燈號將持續呈現紅色。請關閉電源再依a~d的順序重新操作配對程序。

7 OPERATING RADIO STEERING FUNCTION
遙控器設定－轉向



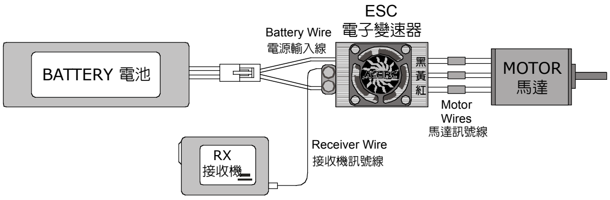




a. Check the radio steering functions. With the radio transmitter and receiver on, turn the steering wheel to the left. The front tires/wheels should turn left accordingly. If not, flip the steering servo reverse switch.
b. Return the steering wheel to neutral. The front tires/wheels should point straight forward. If not, use the steering trim lever to correct it.
c. Turn the steering wheel to the right. The front tires/wheels should turn right accordingly.

a. 確認轉向功能。打開發射機及接收機電源，方向轉左邊時，輪胎將朝向左邊，若方向不一致，請調整方向的正逆轉開關。
b. 方向舵回中立點時，前輪應筆直向前，若有偏差，請調整方向舵微調旋鈕。
c. 方向舵轉向右邊時，前輪應轉向右邊。

8 ADJUSTING THE ELECTRONIC SPEED CONTROL(ESC)
速控器調整



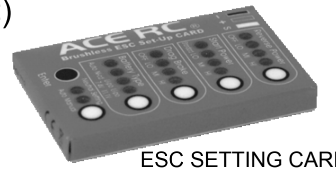
Calibrating your ESC and transmitter.

1. Install the ESC according to the diagram shown above. Switch on the transmitter first, and then switch on the ESC power.
2. Once the ESC is switched on, it will emit a series sound indicating the ESC is actuating. Adjust the throttle trim to get the best neutral position. When neutral is set, another confirmation sound is emitted. If it fails to set up neutral, the confirmation sound will not be heard. In such a case, re-do & re-check the system again starting from Step1 of these instructions. This ESC is applicable to transmitters with either 50/50 or 70/30 throttle/brake movement range.
3. Confirm that the throttle forward direction coincides with the ESC forward direction. Lift the car off its wheels. Move the throttle forward and watch the wheel's rotation direction, then move the throttle backwards and see if the system brakes.
4. If the wheels' movement coincides with the throttle input then the setting is correct. If the movement is opposite then switch off the ESC, change the setting on the transmitter's throttle reversing switch, and go back to Step 2.
5. Motor rotation direction - Slowly apply throttle to check if the motor is rotating in the correct direction.
   To reverse the direction of the motor, switch any two of the motor wires. Note: Do not reverse the battery wire connections!
   Reversing the battery polarity will permanently damage the ESC.
6. For the first trial run, start with a smaller gear motor for 2~3 minutes then monitor the temperatures of both the ESC & motor. If both temperatures are similar to each other, they are at good match. The gear ratio can then be properly adjusted to the desired optimum ratio depending on the type of car and track. However, it is very important to always keep both temperatures under 95 °C, when selecting a gear ratio. A higher gear ratio (larger pinion or smaller spur gear) will increase the system temperature. Running the system at increased temperatures will cause demagnetization of the motor, resulting in a dramatic drop of motor efficiency.
7. It is ok to replace a higher gear ratio or a higher KV motor if the temperature is kept under 80 °C but it should be done in accordance to the instructions in Step 6. Start from a lower ratio then incrementally adjust higher. Battery selection is also an important consideration. Changing to a higher voltage battery will require a lower KV motor and/or a lower gear ratio, unless the original motor has a low enough KV rating to begin with. The ESC will be burn out if the motor and gear ratio does not match the input voltage properly. See the example below showing how battery voltage affects power output.
   Input 7.2V, internal resitance 0.18Ω--- 40A
   (V/R=I 7.2/0.18=40A)
   Input11.1V, internal resistance 0.18Ω--- 61.6A
   (V/R=I 11.1/0.18=61.6A)

1. 請依上圖所示接線，完成後打開發射機的電源，再開ESC的電源，（先確定遙控器的"前進"定義與ESC的"前進"定義是否一致，請先將遙控車墊高，使四個輪子可以空轉）打開後ESC會先發出一組開機音，接著自動抓取中立點，完成後會再發出確認音，如果沒有確認音，即表示ESC沒有抓到中立點尚未完成設定，請檢查發射機電源是否開啓，若沒有時請將它打開即可自動偵測，並支援50%：50%及70%：30%的遙控器切換模式，自動完成中立點設定。
2. 輕推遙控器上的油門撥桿往前進方向推，先不管車輪是否正轉，只要馬達有起動運轉即可，然後迅速將油門控制撥桿推到後退的位置不要放開，如果是呈煞車狀態，表示目前遙控器的前進定義與電子變速器的定義一致，(如果只有停頓一下就立即反轉，表示遙控器與變速器的定義相反，請將遙控器上油門位置的正反轉開關切到相反方向）放開油門控制撥桿使它回到中立點，關掉ESC電源再重新開啓，重新抓取中立點後，再往前進方向推一次，此時遙控車應呈前進狀態，請檢視車輪旋轉方向是不是在前進，如是即表示目前所有設定都是正確，可以下場試車了，如果這時車輪運轉方向是後退，請將電子變速器連接到馬達的三條輸出線中的任意兩條對調，即可改變馬達的運轉方向了。（在大部份情況下油門正反轉設定跟ESC的設定相反時，ESC不會抓取中立點，不同廠牌的遙控器會有不同的差異）。**注意!!!應注意電源輸入端的極性不可逆接，一旦逆接會使ESC產生嚴重的短路並燒毀**。
3. 先用較小齒數的馬達齒安裝，試跑2~3分鐘後檢查一下馬達跟ESC的溫度是否會相差很多，如果兩者的溫度相近表示目前搭配適合，可依據場地賽道的特性來改變齒比，但仍須留意ESC及馬達的溫度，建議應該把溫度控制在攝氏95度以內，超過攝氏100度時馬達的磁鐵其實已會開始退磁，整體效率也會開始下降，導致馬達溫度攀速上昇，銅線阻抗也開始變大，反而消耗掉電池的部份電量，變成熱消耗掉而已。
4. 若兩者溫差過高時，就要依據ESC或馬達兩個何者較高來做一些調整，如果ESC的溫度在約攝氏80度以內，表示可以加大馬達齒輪比或換用Kv值略大的馬達試試看，以增加車速，但同時也要注意馬達溫度，同樣把握一個原則，先用較輕的齒比搭配，再依兩者的溫昇來調整齒比。如改用較高電壓的電池時一定要換較低Kv值的馬達或更換較輕馬達齒輪比，因為同一個馬達的內部阻抗是固定的，若使用不同的電壓輸入的話其消耗電流會有很大的不同，沒有注意ESC的規格隨意配用馬達或變動輸入電壓的話很容易使ESC燒毀，以下為一個簡例說明：
   輸入電壓7.2V時，一個內阻為0.18Ω的馬達會消耗40A的電流
   (I=V/R 即 7.2/0.18=40) =288W
   輸入電壓11.1V時，一個內阻為0.18Ω的馬達會消耗61.6A的電流
   (I=V/R 即11.1/0.18=61.6)=684W
   輸入電壓雖然只提高3.9V，但是功率卻多了一倍，所以我們強烈的建議使用者在使用較高電壓前一定要先檢查ESC的溫度，同時降低馬達的Kv值，再依兩者的溫昇來調整齒比。

9 BLC-40C ESC SETUP PROGRAMMING 速控器設定

(ESC Setting Card is not included in the kit 速控器設定卡需另購)



ESC SETTING CARD

■ **Driving forward**

With the car at rest, move the throttle full forward and the car will be in so-called “Hard Start” mode with a very fast initial start without any delay on accelerating. The car will reach the full speed from still in the shortest time. The motor perfectly responds to the signal of acceleration instantly.

(User can use the ESC setting card to set the level of forward driving power, there are 4 modes to select from. Default has been set in standard mode. For more information, please see the instruction of ESC setting card.)

■ **Braking**

The brakes will be actuated by reversing the throttle direction while driving forwards. Braking power is modulated by the amount of throttle input in the brake/reverse direction. The maximum braking power can be adjusted using the transmitter EPA (depends on the functions of the selected transmitter, for details please consult the instructions of your transmitter). The brake efficiency will also be influenced depending on whether the reversing function is switched on. See section “Driving backwards”.

■ **Driving backwards**

Reverse is actuated by moving the throttle to the brake/reverse direction after the car has come to a stop. Reverse speed is modulated by the amount of throttle input in the brake/reverse direction. While the car is still moving forward, the brakes will be actuated when the throttle is moved in the brake/reverse direction. Reverse will not engage until the wheels have come to a stop.

(User can use the ESC setting card to set the level of driving power, there are 3 modes to select from. Default has been set in standard mode. For more information, please see the instruction of ESC setting card.)

■ **Over temperature protection**

Motor will be intermittently turned off if the temperature reaches around 95°C. An optional cooling fan is recommended to increase ESC ventilation.

■ **前進**：操作遙控器上的油門扳機往後勾可使車子前進，起動快速，加速不延遲的特性，即一般所謂硬起動的方式，使馬達從靜止狀態加速到全速耗時最短，符合即時加速反應的需求，低電壓的CUT方式為關閉輸出使馬達停止運轉，待油門控制撥桿回到中立點後再做加油動作時才會重新啓動馬達。(前進的啓動功率可經由設定卡調整大小，共有4種模式可選擇)

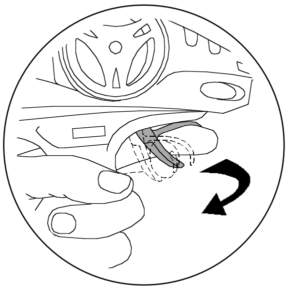
■ **煞車**：車子前進中將油門扳機往前推時即可煞車，可以以點煞方式煞車。除非車速下降到一定程度或輪胎打滑，否則不管點煞幾次都可以，馬達不會反轉。煞車強度可經由遙控器的動作行程調整(有支援此功能的遙控器才能)煞車力道，但有開啓後退功能的話會同時影響後退功率。

■ **後退**：車子靜止中或慢速滑行時將油門扳機往前推，即可使遙控車後退，後退車速可以用油門撥桿的推量來做比例式的控制，後退中將遙控器上的油門扳機往前勾時，馬達會立即反轉，只做短暫的煞車。(後退功能及功率可經由設定卡調整開啓或關閉及功率大小，共有3種模式可選擇)

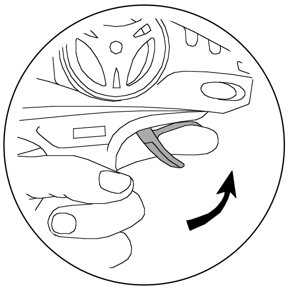
■ **過溫保護**：本ESC內部設有溫度檢知功能，並設定95度時啓動過溫保護，以避免ESC因過溫操作而燒燬。本型ESC可外接風扇，可以選購散熱風扇組來改ESC的過熱問題。

10 DRIVING BASIC 操控基本動作

Stop (Neutral)
停止（中立點）



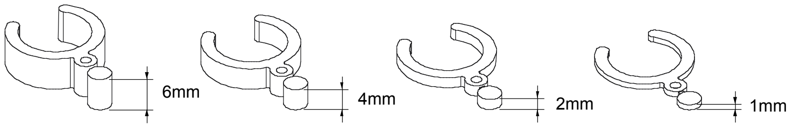
Brake
煞車



Reverse
後退

Acceleration
加速

11 SHOCK ADJUSTMENT 避震器懸吊調整

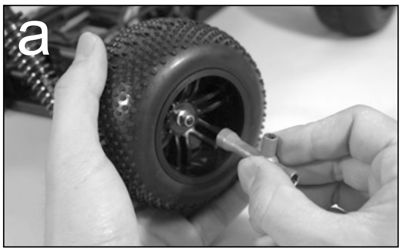


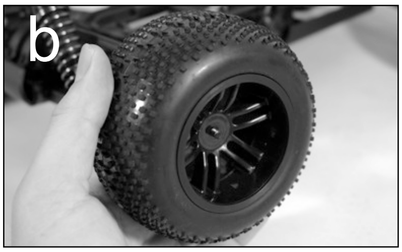
Hard Suspension
懸吊較硬

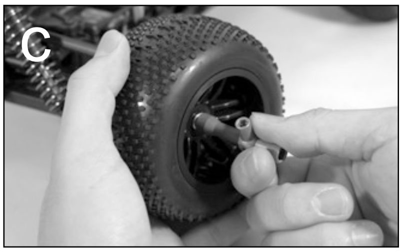
Soft Suspension
懸吊較軟

Use the included shock clips to adjust for spring pre-load.
使用內附的避震器調整環，調整車身高度。更詳細的調整方式請參考設定表。

12 WHEEL AND TIRE PREPARATION 輪胎及輪轂







a. Remove wheel lock nut using the 4-way wrench and detach wheels.
b. Replace fresh tires and wheels if the original tires are worn out.
c. Tighten the wheel lock nut.

a. 使用內附之六角螺帽套筒板手將輪轂上六角固定螺帽取下。
b. 將已磨損嚴重之輪胎組取下後，換上新的輪胎組。
c. 將六角固定螺帽重新鎖緊。

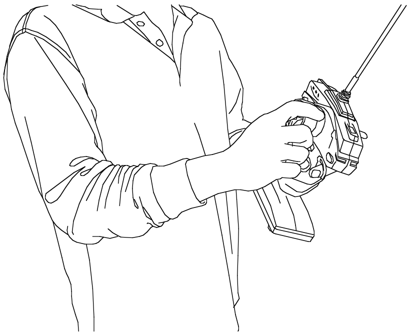
13 MAINTENANCE AFTER RUNNING 車體保養

a. Always turn off the radio system and disconnect the battery pack when the car is not in use.
b. Remove sand, mud, dirt, and any other elements before storing the car.
c. Never use chemicals or any solvents to clean the chassis as it may cause damage to the electronics components and plastic parts. Use compressed air, soft paintbrush, or toothbrush to clean dust and dirt.

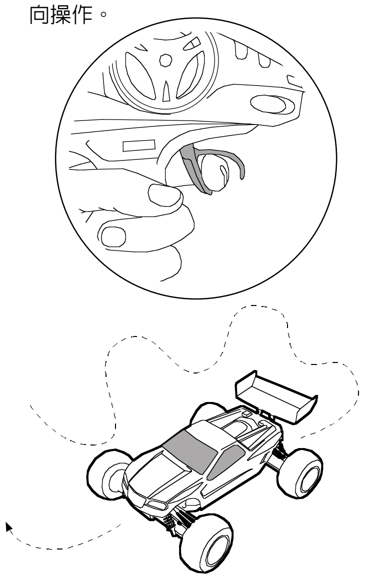
a. 結束操控儲存車體前，請謹記要關閉電源，並將電池接頭拔除，以免電池短路造成不必要之危險。
b. 清潔車體上所沾附之沙塵、泥屑。
c. 請勿使用化學清潔劑來清洗底板，以免遙控之電子設備受潮、電線、焊點及塑膠件被侵蝕而導致不必要之損壞。 清潔車體時，請儘量使用強力之壓縮空氣，搭配軟毛刷來請清理車體上所沾附之沙塵、泥屑。

14 DRIVING TIPS 操控的小技巧

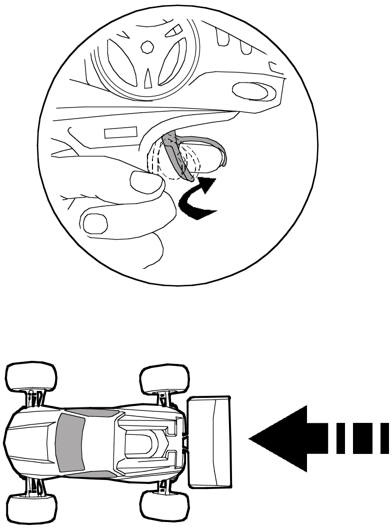
a. Hold your elbows in and keep the transmitter antenna pointing straight up.
a. 手持發射機時請將雙肘靠緊身體並保持發射機天線朝上。



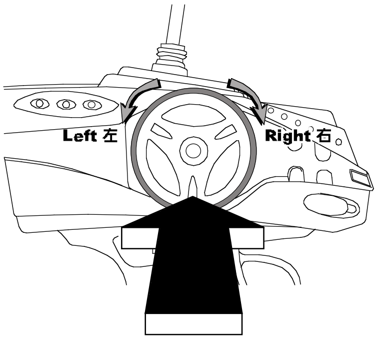
b. Squeeze the throttle trigger or pull the throttle stick gently and steer the car to left and right.
b. 開始操控前按扣油門板機(油門拉桿)時請緩慢增加油門並試著熟悉前輪轉向操作。



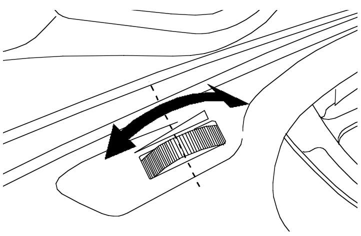
c. Squeeze the throttle trigger and release. Repeat this action to control car speed.
c. 初學者請先熟悉油門操控再慢慢加快車子行進速度。



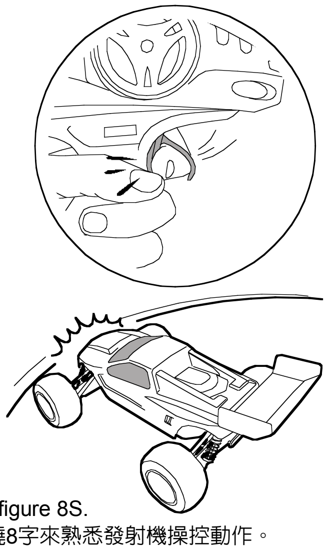
d. If you are of unsure of the steering direction, practice with the transmitter facing towards you.
d. 假設你不確定發射機的轉向，將發射機轉輪面向自己，先熟悉左右轉向。



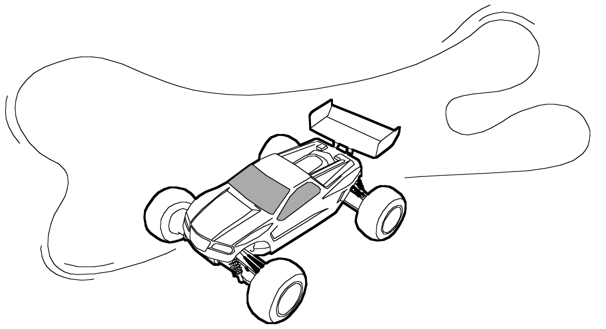
e. At first, set the steering D/R function for less steering response.
e. 初學者可參考發射機說明書調整D/R功能，以避免轉向太過靈活不易操控。



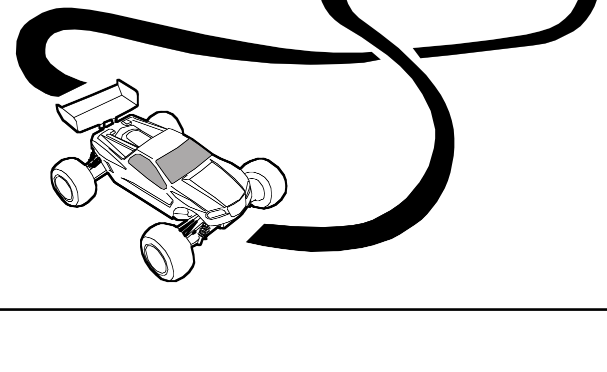
f. Be careful not to squeeze the throttle trigger abruptly while steering.
f. 轉向時請勿將油門全開以避免速度過快導致失控翻覆。



g. After you become used to the controls, experiment with high performance at full throttle and full steering.
g. 熟悉前述基本操控後再試著將油門全開進行高速操控。



h. Practice doing figure 8S.
h. 建議可以使用繞8字來熟悉發射機操控動作。



SPARROWHAWK XXT XXB

TROUBLESHOOTING 常見問題與解決辦法

If you have trouble starting or keeping your SPARROWHAWK XXT/XXB running, here's a quick checklist of what to look for first.

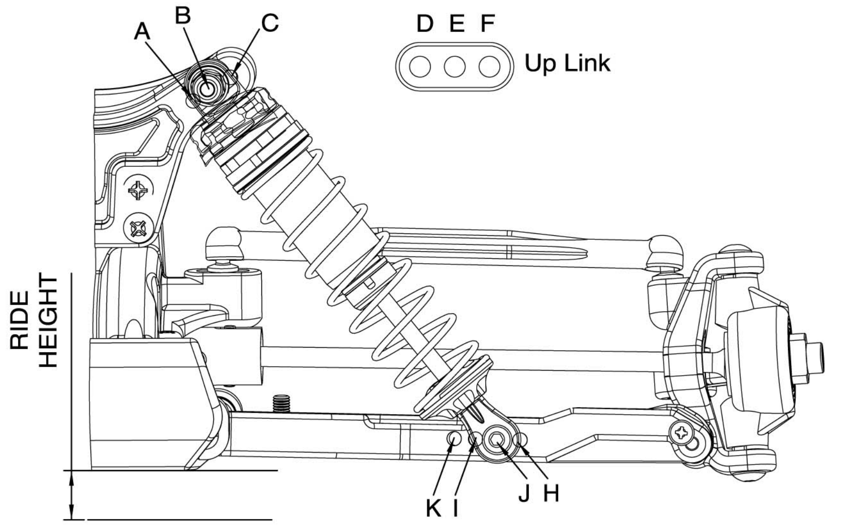
如果您的 SPARROWHAWK XXT/XXB 有行駛上的問題，您可以參考下表的說明。
如果問題無法解決，請與原購買經銷商聯絡。

Description 問題	Problem 可能原因	Solution 解決方法
Car dies or slows 車不動或速度變慢	Speed control over heats 速控器過熱	Let it cool and try later 先冷卻，稍後再試
Car is glitching 車故障	Car has a problem on power 車子的動力有問題	Check for loose wires, dead radio batteries. 檢查電線是否脫落或遺失
Motor overheats 馬達過熱	Gear mesh is too tight 馬達驅動齒輪太緊	Let motor cool and check recommended gearing for motor type. Reset gear mesh 先讓馬達冷卻，再重新調整合適的齒隙
No power 失去電力	Battery is discharged 電池沒充電	Charge battery 將電池充電
	Battery not plugged in 電池沒接好	Plug battery in 將電池接頭確實連接遙控車
No throttle 失去動力	Motor not plugged in 馬達連接線沒接好	Plug motor in 確實接上紅、黃、黑端之馬達電源傳輸線（紅對紅、黃對黃、黑對黑）
	Motor failure 馬達損壞	Replace motor 置換新馬達
	Motor keeps running 未扣引發射機油門，馬達卻持續轉動	Check if the throttle trim is in neutral position. 檢查是否油門微調不在中立點的位置
No steering 失去控制	Servo not plugged in 轉向伺服機未安裝好	Plug servo into ESC unit 將連接電線接上速控器
	Locked up steering linkage 轉向裝置卡死	Free up steering linkage 排除可能的干涉（卡住）的零件部位
	Servo failure 伺服機失靈	Replace servo 置換新伺服機
Reversing 後退功能	Goes backwards when you pull the trigger or goes right when turning the wheel left 當扣引／放開發射機油門板機，車子卻後退／前進或是發射機方向轉輪之轉向跟車子轉向左右相反	Check throttle / steering reversing switches on transmitter 檢查發射機上之油門／轉向的反轉開關是否反轉？

SPARROWHAWK XXT SETUP SHEET Ver 1.0

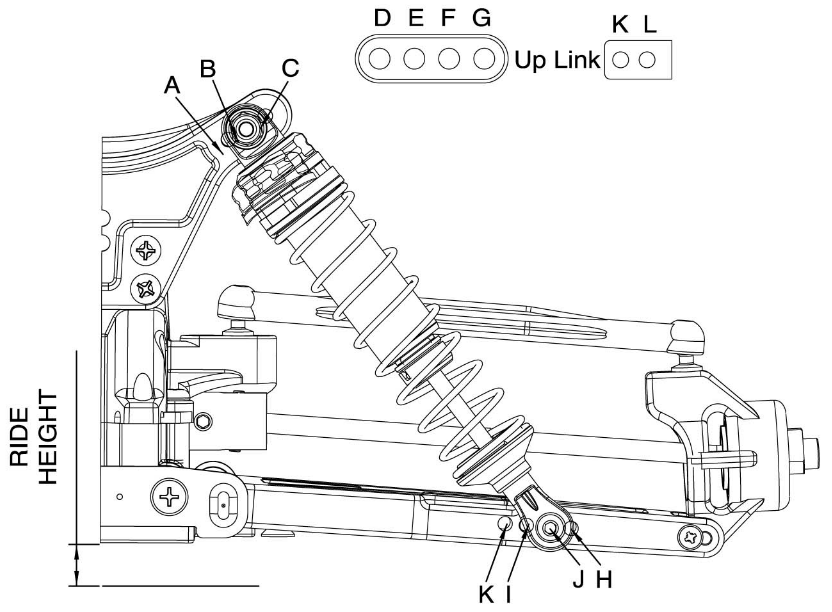
NAME		EVENT		DATE	
TRACK		TEMP		CONDITIONS	
SERVO		ESC		RADIO	

FRONT



SHOCKS	
SHOCK OIL	
SHOCK PISTON	Ø1.2 Ø1.3 Ø1.4
SPRING	
SHOCK POSITION	A B C H G
ALIGNMENT	
CASTER ANGLE	
CAMBER ANGLE	
TOE IN	
RIDE HEIGHT	
TIRES	
TIRE TYPE	
TIRE HARDNESS	
TIRE DIAMETER	
INSERT HARDNESS	
SUSPENSION GEOMETRY	
LOWER ARM POSITION	
CAMBER LINK POSITION	D E F
SWAY BAR	
DIFFERENTIALS	
DIFF OIL	

REAR



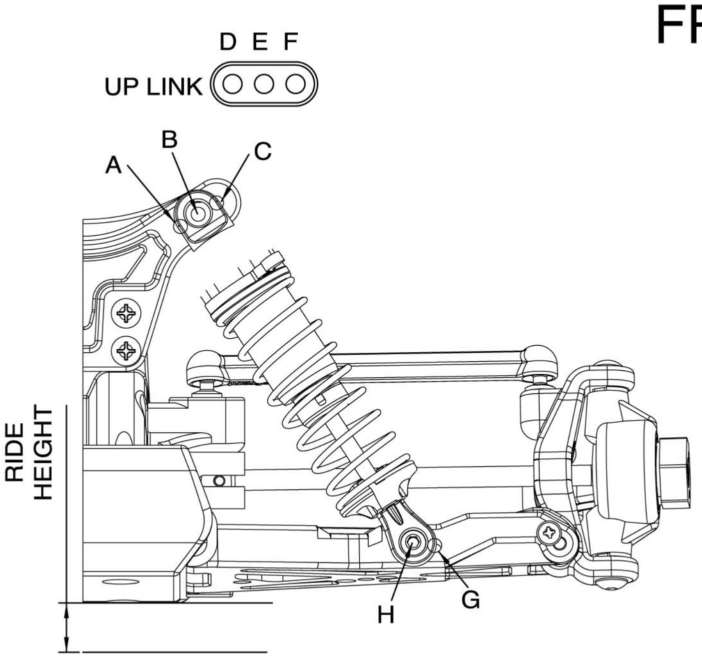
SHOCKS	
SHOCK OIL	
SHOCK PISTON	Ø1.2 Ø1.3 Ø1.4
SPRING	
SHOCK POSITION	A B C J H
ALIGNMENT	
CASTER ANGLE	
CAMBER ANGLE	
TOE IN	
RIDE HEIGHT	
TIRES	
TIRE TYPE	
TIRE HARDNESS	
TIRE DIAMETER	
INSERT HARDNESS	
SUSPENSION GEOMETRY	
LOWER ARM POSITION	
CAMBER LINK POSITION	D E F G K L
SWAY BAR	
DIFFERENTIALS	
DIFF OIL	

MOTOR TYPE		SPUR	t	PINION	t
BRUSH		SPRING		TIMING	°
BODY		WING		BATTERY	

SPARROWHAWK XXB SETUP SHEET Ver 1.0

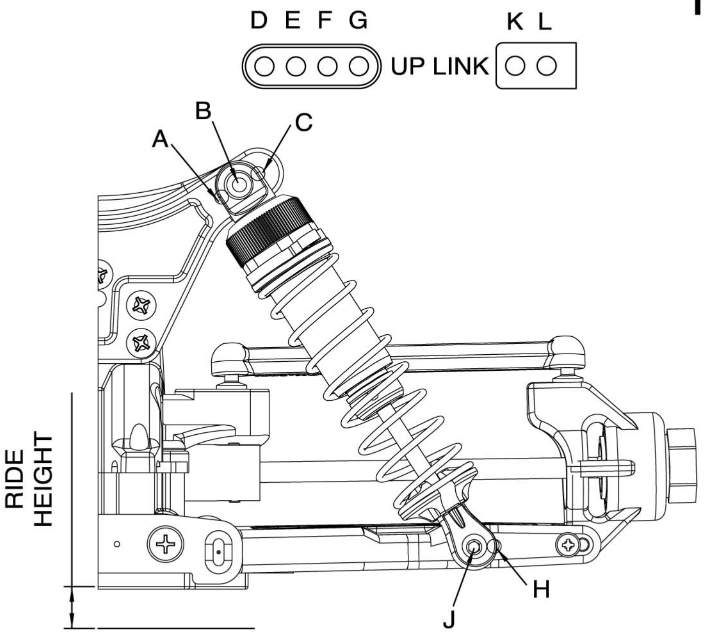
NAME		EVENT		DATE	
TRACK		TEMP		CONDITIONS	
SERVO		ESC		RADIO	

FRONT



SHOCKS			
SHOCK OIL			
SHOCK PISTON	Ø1.2	Ø1.3	Ø1.4
SPRING			
SHOCK POSITION	A	B	C
	H	G	
ALIGNMENT			
CASTER ANGLE			
CAMBER ANGLE			
TOE IN			
RIDE HEIGHT			
TIRES			
TIRE TYPE			
TIRE HARDNESS			
TIRE DIAMETER			
INSERT HARDNESS			
SUSPENSION GEOMETRY			
LOWER ARM POSITION			
CAMBER LINK POSITION	D	E	F
SWAY BAR			
DIFFERENTIALS			
DIFF OIL			

REAR



SHOCKS				
SHOCK OIL				
SHOCK PISTON	Ø1.2	Ø1.3	Ø1.4	
SPRING				
SHOCK POSITION	A	B	C	
	J	H		
ALIGNMENT				
CASTER ANGLE				
CAMBER ANGLE				
TOE IN				
RIDE HEIGHT				
TIRES				
TIRE TYPE				
TIRE HARDNESS				
TIRE DIAMETER				
INSERT HARDNESS				
SUSPENSION GEOMETRY				
LOWER ARM POSITION				
CAMBER LINK POSITION	D	E	F	G
	K	L		
SWAY BAR				
DIFFERENTIALS				
DIFF OIL				

MOTOR TYPE		SPUR	t	PINION	t
BRUSH		SPRING		TIMING	°
BODY		WING		BATTERY	

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JD7249